Preparation of three-dimensional mammalian ovarian follicular cell and ovarian follicle culture systems in a biocompatible matrix.

ABSTRACT

A process for encapsulating and immobilising mammalian stem cells, ovarian follicular cells, gametes, ovarian follicles or mammalian embryos which are able to auto-organise into three-dimensional structures *in vitro*, and express biological functions in a manner similar to that which is observed in the organism *in vivo* is described.

The capsules are constituted by:

- a nucleus containing stem cells, ovarian follicular cells, gametes ovarian follicles or mammalian embryos and/or a biocompatible and/or biodegradable polymer;
- a semi-permeable membrane constituted by a divalent or trivalent metal ion salt of alginic acid, optionally cross-linked on the inner and/or outer surface and/or on both surfaces, optionally vehicularising a second or more cellular species.

The cells and follicles prepared and cultivated using this methodology are used for the *in vitro* and/or *in vivo* production of peptides, proteins, antibodies, hormones and hormone precursors, metabolites and catabolites typical of these cellular structures, plasma membranes, nuclear membranes, cytoplasmic organelles,

somatic cell nuclei or gametes and embryos.